

CLAIMS

What is claimed is:

1 1. A method for preparing an implantable device for a sustained delivery of a
2 substance within a body of a human or an animal subject, said method comprising the
3 steps of:

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5 (A) dissolving a biocompatible polymer in a suitable solvent solution to
6 produce a polymer-solvent solution;

7 (B) adding said substance to said polymer-solvent solution to produce a
8 polymer-solvent solution-substance admixture;

9 (C) drying said polymer-solvent solution-substance admixture to form a
10 substantially dry mass;

11 (D) refrigerating said mass.

1 2. A method according to claim 1 wherein, between steps C and D, said method
2 further comprises:

3 adding a liquid to said mass to cause said mass to soften;

4 manipulating said softened mass to a desired shape.

1 3. A method according to claim 1 wherein a second polymer-solvent solution-
2 substance admixture made by steps (A) and (B) is added to said substantially dry
3 mass of said step (C) and said second polymer-solvent solution-substance admixture
4 is allowed to dry.

1 4. A method according to claim 1 wherein said polymer is non-biodegradable.

1 5. A method according to claim 4 wherein said non-biodegradable polymer is
2 selected from the group consisting of Hydron, polyester, polycarbonate, polysulfone,

3 polyvinyl chloride, polyethylene, polypropylene, poly(N-vinyl pyrrolidone), poly(methyl
4 methacrylate), poly(vinyl alcohol), poly(acrylic acid), polyacrylamide,
5 poly(ethylene-co-vinyl acetate), poly(ethylene glycol), poly(methacrylic acid), mixtures
6 thereof and combinations thereof.

1 6. A method according to claim 4 wherein said non-biodegradable, polymer is
2 Hydron.

1 7. A method according to claim 1 wherein said polymer is biodegradable.

1 8. A method according to claim 7 wherein said , biodegradable polymer is
2 selected from the group consisting of poly (ethylene glycol), polyvinylpyrrolidone,
3 polylactides (PLA), polyglycolides (PGA), poly(lactide-co-glycolides) (PLGA),
4 polyanhydrides, polyorthoesters, mixtures thereof and combinations thereof.

1 9. A method according to claim 1 wherein said solvent solution comprises an
2 organic solvent.

1 10. A method according to claim 1 wherein said solvent solution comprises
2 ethanol.

1 11. A method according to claim 1 wherein said solvent solution comprises about
2 70% ethanol.

1 12. A method according to claim 1 wherein said substance is a chemical.

1 13. A method according to claim 1 wherein said substance is a therapeutic agent.

1 14. A method according to claim 1 wherein said substance is a biomolecule.

- 1 15. A method according to claim 1 wherein said substance is a therapeutic
2 biomolecule.
- 1 16. A method according to claim 1 wherein said substance is an anti-inflammatory
2 agent.
- 1 17. A method according to claim 1 wherein said substance is an antineoplastic
2 agent.
- 1 18. A method according to claim 1 wherein said substance is a protein.
- 1 19. A method according to claim 1 wherein said substance is a steroid.
- 1 20. A method according to claim 1 wherein said substance is a hormone.
- 1 21. A method according to claim 1 wherein said substance is an RNA, DNA or
2 combination thereof.
- 1 22. A method according to claim 1 wherein said substance is an anti-sense
2 oligoribonucleotide sequence, antisense oligonucleotide sequence or a combination
3 thereof.
- 1 23. A method according to claim 1 wherein said substance is an anti-sense
2 oligonucleotide, anti-sense oligoribonucleotide or combination thereof to a focal
3 adhesion kinase RNA.
- 1 24. A method according to claim 1 wherein said substance is an anti-sense
2 oligonucleotide anti-sense oligoribonucleotide or combination thereof to a focal
3 adhesion kinase gene.

1 25. A method according to claim 1 wherein said substance comprises VEGF,
2 bFGF or a combination thereof.

1 26. A method for using an implantable device comprising a step of introducing a
2 device produced according to claim 1 into a body of a human or animal subject such
3 that said substance will be released from said device.

1 27. A method according to claim 26 wherein said introducing step comprises a
2 step of implanting said device into an eye.

1 28. A method according to claim 26 wherein said introducing step comprises a
2 step of implanting into a vitreous of an eye by surgical means.

1 29. A method according to claim 26 wherein said introducing step comprises a
2 step of implanting said device into a subchoroidal space, where a sclera is cut to
3 expose a choroidea.

1 30. A method according to claim 26 wherein said substance causes a therapeutic
2 benefit to occur in said body of said subject into which said device is implanted.

1 31. A method according to claim 26 wherein said introducing step causes a
2 desired disease or disorder in said animal so as to provide an animal model for said
3 disease or disorder.

1 32. A method according to claim 31 wherein said disorder is neovascularization.

1 33. A method according to claim 31 wherein said disease is age-related macular
2 degeneration.

1 34. An implantable substance delivery device for a sustained delivery of a
2 substance within a body of a human or an animal subject made by a method
3 according to claim 1.

1 35. A method for preparing an implantable device for a sustained delivery of a
2 substance within a body of a human or an animal subject, said method comprising
3 the steps of:

4 (A) dissolving a biocompatible polymer in a suitable solvent solution to
5 produce a polymer-solvent solution;

6 (B) adding said substance to said polymer-solvent solution to produce a
7 polymer-solvent solution-substance admixture;

8 (C) drying said polymer-solvent solution-substance admixture to form a
9 substantially dry mass;

10 (D) adding a liquid to said mass to cause said mass to soften and;

11 (E) manipulating said softened mass to a desired shape.

1 36. A method according to Claim 35 which further comprises a step F, said step
2 F comprising refrigerating said mass.

1 37. A method according to claim 35 wherein a second polymer-solvent solution-
2 substance admixture made by steps (A) and (B) is added to said substantially dry
3 mass of said step (C) and said second polymer-solvent solution-substance admixture
4 is allowed to dry.

1 38. A method according to claim 35 wherein said polymer is non-biodegradable.

1 39. A method according to claim 38 wherein said non-biodegradable polymer is
2 selected from the group consisting of Hydron, polyester, polycarbonate, polysulfone,
3 polyvinyl chloride, polyethylene, polypropylene, poly(N-vinyl pyrrolidone), poly(methyl
4 methacrylate), poly(vinyl alcohol), poly(acrylic acid), polyacrylamide,

5 poly(ethylene-co-vinyl acetate), poly(ethylene glycol), poly(methacrylic acid), mixtures
6 thereof and combinations thereof.

1 40. A method according to claim 38 wherein said non-biodegradable, polymer is
2 Hydron.

1 41. A method according to claim 35 wherein said polymer is biodegradable.

1 42. A method according to claim 41 wherein said , biodegradable polymer is
2 selected from the group consisting of poly (ethylene glycol), polyvinylpyrrolidine,
3 polylactides (PLA), polyglycolides (PGA), poly(lactide-co-glycolides) (PLGA),
4 polyanhydrides, polyorthoesters, mixtures thereof and combinations thereof.

1 43. A method according to claim 35 wherein said solvent solution comprises an
2 organic solvent.

1 44. A method according to claim 35 wherein said solvent solution comprises
2 ethanol.

1 45. A method according to claim 35 wherein said solvent solution comprises about
2 70 to about 95% ethanol.

1 46. A method according to claim 35 wherein said substance is a chemical.

1 47. A method according to claim 35 wherein said substance is a therapeutic
2 agent.

1 48. A method according to claim 35 wherein said substance is a biomolecule.

1 49. A method according to claim 35 wherein said substance is a therapeutic
2 biomolecule.

1 50. A method according to claim 35 wherein said substance is a protein.

1 51. A method according to claim 35 wherein said substance is a steroid.

1 52. A method according to claim 35 wherein said substance is a hormone.

1 53. A method according to claim 35 wherein said substance is an RNA, DNA or
2 combination thereof.

1 54. A method according to claim 35 wherein said substance is an anti-sense
2 oligoribonucleotide sequence, antisense oligonucleotide sequence or a combination
3 thereof.

1 55. A method according to claim 35 wherein said substance is an anti-sense
2 oligonucleotide, anti-sense oligoribonucleotide or combination thereof to a focal
3 adhesion kinase RNA.

1 56. A method according to claim 35 wherein said substance is an anti-sense
2 oligonucleotide anti-sense oligoribonucleotide or combination thereof to a focal
3 adhesion kinase gene.

1 57. A method according to claim 35 wherein said substance comprises VEGF,
2 bFGF or a combination thereof.

1 58. A method for using an implantable device comprising a step of introducing a
2 device produced according to claim 35 into a body of a human or animal subject
3 such that said substance will be released from said device.

1 59. A method according to claim 58 wherein said introducing step comprises a
2 step of implanting said device into an eye.

1 60. A method according to claim 58 wherein said introducing step comprises a
2 step of implanting into a vitreous of an eye by surgical means.

1 61. A method according to claim 58 wherein said introducing step comprises a
2 step of implanting said device into a subchoroidal space, where a sclera is cut to
3 expose a choroidea.

1 62. A device according to claim 58 wherein said substance causes a therapeutic
2 benefit to occur in said body of said subject into which said device is implanted.

1 63. A method according to claim 58 wherein said introducing step causes a
2 desired disease or disorder in said animal so as to provide an animal model for said
3 disease or disorder.

1 64. A method according to claim 63 wherein said disorder is neovascularization.

1 65. A method according to claim 63 wherein said disease is age-related macular
2 degeneration.

1 66. An implantable substance delivery device for a sustained delivery of a
2 substance within a body of a human or an animal subject made by method according
3 to claim 35.

1 67. A method for preparing an implantable device for a sustained delivery of a
2 substance within a body of a human or an animal subject, said method comprising
3 the steps of:

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5 (A) dissolving a biocompatible polymer in a suitable solvent solution to
6 produce a polymer-solvent solution;

7 (B) adding said substance to said polymer-solvent solution to produce a
8 polymer-solvent solution-substance admixture;

9 (C) drying said polymer-solvent solution-substance admixture

10 (D) adding a second polymer-solvent solution-substance admixture to said
11 air-dried polymer-solvent solution-substance admixture of said step (C) and said
12 second polymer-solvent solution-substance admixture is allowed to dry.

1 68. A method according to claim 67 comprising a step after D, wherein said step
2 comprises:

3 adding a liquid to said mass to cause said mass to soften;
4 manipulating said softened mass to a desired shape.

1 69. A method according to claim 67 comprising a step after D wherein said step
2 comprises refrigerating said mass.

1 70. A method according to claim 67 wherein said polymer is non-biodegradable.

1 71. A method according to claim 70 wherein said non-biodegradable polymer is
2 selected from the group consisting of Hydron, polyester, polycarbonate, polysulfone,
3 polyvinyl chloride, polyethylene, polypropylene, poly(N-vinyl pyrrolidone), poly(methyl
4 methacrylate), poly(vinyl alcohol), poly(acrylic acid), polyacrylamide,
5 poly(ethylene-co-vinyl acetate), poly(ethylene glycol), poly(methacrylic acid), mixtures
6 thereof and combinations thereof.

1 72. A method according to claim 70 wherein said non-biodegradable, polymer is
2 Hydron.

1 73. A method according to claim 67 wherein said polymer is biodegradable.

1 74. A method according to claim 73 wherein said , biodegradable polymer is
2 selected from the group consisting of poly (ethylene glycol), polyvinylpyrrolidine,
3 polylactides (PLA), polyglycolides (PGA), poly(lactide-co-glycolides) (PLGA),
4 polyanhydrides, polyorthoesters, mixtures thereof and combinations thereof.

5
6 75. A method according to claim 67 wherein said solvent solution comprises an
7 organic solvent.

1 76. A method according to claim 67 wherein said solvent solution comprises
2 ethanol.

1 77. A method according to claim 67 wherein said solvent solution comprises about
2 70% ethanol.

1 78. A method according to claim 67 wherein said substance is a chemical.

2
3 79. A method according to claim 67 wherein said substance is a therapeutic
4 agent.

1 80. A method according to claim 67 wherein said substance is a biomolecule.

1 81. A method according to claim 67 wherein said substance is a therapeutic
2 biomolecule.

1 82. A method according to claim 67 wherein said substance is a protein.

1 83. A method according to claim 67 wherein said substance is a steroid.

1 84. A method according to claim 67 wherein said substance is a hormone.

1 85. A method according to claim 67 wherein said substance is an RNA, DNA or
2 combination thereof.

1 86. A method according to claim 67 wherein said substance is an anti-sense
2 oligoribonucleotide sequence, antisense oligonucleotide sequence or a combination
3 thereof.

1 87. A method according to claim 67 wherein said substance is an anti-sense
2 oligonucleotide, anti-sense oligoribonucleotide or combination thereof to a focal
3 adhesion kinase RNA.

1 88. A method according to claim 67 wherein said substance is an anti-sense
2 oligonucleotide anti-sense oligoribonucleotide or combination thereof to a focal
3 adhesion kinase gene.

1 89. A method according to claim 67 wherein said substance comprises VEGF,
2 bFGF or a combination thereof.

1 90. A method for using an implantable device comprising a step of introducing a
2 device produced according to claim 67 into a body of a human or animal subject
3 such that said substance will be released from said device.

1 91. A method according to claim 90 wherein said introducing step comprises a
2 step of implanting said device into an eye.

1 92. A method according to claim 90 wherein said introducing step comprises a
2 step of implanting into a vitreous of an eye by surgical means.

1 93. A method according to claim 90 wherein said introducing step comprises a
2 step of implanting said device into a subchoroidal space, where a sclera is cut to
3 expose a choroidea.

1 94. A device according to claim 90 wherein said substance causes a therapeutic
2 benefit to occur in said body of said subject into which said device is implanted.

1 95. A method according to claim 90 wherein said introducing step causes a
2 desired disease or disorder in said animal so as to provide an animal model for said
3 disease or disorder.

1 96. A method according to claim 95 wherein said disorder is neovascularization.

1 97. A method according to claim 95 wherein said disease is age-related macular
2 degeneration.

1 98. An implantable substance delivery device for a sustained delivery of a
2 substance within a body of a human or an animal subject made by method according
3 to claim 67.